

the adjoining counties. Thousands of acres in the environs could be acquired and turned into gardens with the savings of a single year in the perfect combustion of fuel. In times of distress a sum equal to the wages of 100,000 labourers is now thrown away in the manufacture of an artificially coloured atmosphere. Remedies in accordance with science are at hand; it only remains for society to see that they are applied.

DESICCATED HUMAN REMAINS.

SOME time ago, Signor S. Marghieri, the Mexican archæologist, while exploring the eastern side of the Sierra Madre Mountains in Mexico, at an elevation of nearly seven thousand feet, discovered and explored a hermetically sealed cave. The floor was nearly smooth, the sides rough and rugged, and the vault covered with stalactites. At the far end of the cave, which was of considerable dimensions, four mummified human bodies were found. The bodies—a full-grown male and female, and a boy and girl—were in a sitting posture, hands crossed on the breast, and knees approaching the chin, with the head inclined forward. They were all carefully enshrouded in burial garments, and accurately placed facing the rising sun. We may suppose that the elder male and female were husband and wife. They sat side by side; the elder child, a boy, was placed to the right of the father; the younger, a little girl, to the left of the mother. There was no trace of any implements, utensils, or personal effects; nor were there on the walls hieroglyphics or pictographs. The cave had been sealed by means of sun-dried, adobe bricks, and adobe paste or plaster, together with natural rocks from the mountain. So well was the work done that none but an acute observer would have noticed the artificial closure.

The bodies were brought to San Francisco, and bought by Mr. J. Z. Davis, by whom they were presented to the State Mining Bureau, in the archæological department of which they are now preserved. The following description of them is taken from a careful report drawn up by Dr. Winslow Anderson, for the Board of Trustees of the California State Mining Bureau:—

These naturally mummified bodies differ from mummies proper, in the general acceptance of the term, inasmuch as no embalming process for their preservation was used. They were desiccated in their cave sepulchre by natural elements. The dry hot atmosphere extracted all the moisture from the tissues, and the bodies literally dried up as we would dry jerk-beef, or as the Indians of to-day dry the bison (buffalo) meat which keeps for years.

There is no evidence of these bodies having undergone any preparatory process. The brain, heart, lungs, abdominal and pelvic viscera are all intact and dried to a solid consistency.

The elder male body is about five feet eight inches tall, and well proportioned. The bones are large, and he must have had an excellent physique. He probably weighed between one hundred and eighty and two hundred pounds. All the body now weighs is fourteen pounds.

The integument is well preserved, and presents the appearance of dried hide, or thick parchment, of a dark gray colour, and all that remains between it and the bones are the dried muscles, tendons, nerves, and fascia. The body is well developed, the shoulders measuring from one acromion process to the other, three hundred and ninety millimetres (about fifteen and a half inches); the hands are small, and the fingers tapering; the feet are also small, measuring two hundred and forty millimetres (about nine and a half inches), and highly arched. The phalanges of the digits are perfect, each having the normal number of bones, and the ungual appendages are well preserved and not unusually long.

The body has dried in the sitting posture, hands crossed

and knees drawn towards the chin. The cheek and lips on the left side protrude. This probably occurred during the time of mummification; the moisture leaking from the interior of the brain and surrounding tissues, through the cribriform plate of the ethmoid at the anterior portion of the calvaria, through the cribriform foramina into the inferior meatus nasi, and the head being inclined toward the left, produced this bulging from the force of gravitation. Being itself in turn dried up, the mouth maintained its present shape. Short stiff hairs can be seen on the head. The eyebrows and eyelashes are also distinctly visible. A little hair can also be noticed on the upper lip, but very little beard anywhere on the face. The ears are closely pressed against the sides of the head, and only the cartilages remain. The eyes are quite perfect, and present a slight outward obliquity. The nose, originally broad, has been more flattened by the shrinking of the cartilages and the alæ nasi. The lips are stiff and solid, and the tongue is shrivelled to the consistency of cork. There is a full set of masticators in his mouth, thirty-two in number, and all quite well preserved. A few of the dentures only have the enamel worn down to the dentine. The ribs are large and well formed, indicative of a well-shaped chest. The genitalia are well preserved. On the head there has been a large growth of hair, on the face very little, and on the body scarcely any at all.

Owing to the dried integument and fascia covering the cranium, accurate measurements of the skull are well nigh impossible. The following measurements, however, have been made with as much care and accuracy as the subject permitted. The cranial measurements are as follows: circumference, 530 millimetres; length, occipito-frontal, 178 mm.; breadth, bi-bregmatic, 140 mm.; breadth of frontal, 108 mm.; height, 135 mm.; facial angle, 71°.

The sutures and wormian bones cannot be inspected. The malar bones are quite prominent and the lower maxillary and face may be classified with the group orthognathous.

A careful study of this mesocephalic head would indicate that its possessor was of more than average intelligence. The perceptive are well developed. And, although the animal passions undoubtedly predominate, there is enough veneration or religion to class it among the scaphocephalic skulls.

The elder female body is in a better state of preservation than the preceding body. From a measurement of the individual bones, she would be about five feet five inches tall, and weighed, perhaps, about one hundred and fifty to one hundred and seventy pounds. The body weighs, in its present condition, only twelve pounds. The posture, integument, body, &c., resemble the one previously described. The large, oval pelvis, and the once well developed mammæ bear unmistakable evidence of gestation. The hands and feet are small and well shaped; the foot measuring only two hundred and fifty millimetres (about eight and one half inches). On the head is a luxuriant growth of hair, which centuries have not succeeded in destroying. It is very fine in texture, of a dark brown colour, and entirely unlike any Indian hair seen to-day. A curious feature is observed in connection with the small, well-proportioned ears, both of which are perfectly preserved, and that is, in each lobe is worn, even in the stillness of death, a piece of hollow bamboo or reed, about forty millimetres in length, and ten millimetres in diameter. This was probably considered an ornament in her day. The Indians of to-day pierce the helix and antihelix of the ear, through which holes they suspend ornaments of different kinds. The single perforation in the lobe of this mummified woman's ear would indicate a custom observed by her people, similar to the customs in vogue in the more civilized countries, and are not usually observed by Indians of our own period.

The eyes are singularly perfect, presenting a slightly outward and upward obliquity of the external canthi.

The nose is also quite perfect, and inclined to be rather broad and flat than thin and protruding. The malar bones are very prominent. The lips are thin and stiff, and the tongue is dried and solid. Two central incisores and one canine of the superior maxillary are gone, and several other teeth are badly caried.

Here, again, the hair and dried integument prevent absolutely accurate cranial measurements. The skull measures: circumference, 503 millimetres; length, occipito-frontal, 166 mm.; breadth, bi-bregmatic, 128 mm.; breadth of frontal, 103 mm.; height, 132 mm.; facial angle, 69°.

This skull presents a large forehead and well-developed reasoning powers. It is very rare to find so good a head among Indian women of to-day.

The little boy seems to have been about seven years old. The little fellow had been enveloped in his burial shrouds the same as the larger bodies—hands crossed on the chest, knees doubled on the breast, and the head inclined forward. All the bodies were probably tied in this position when placed in the cave. The body is about three feet tall, and weighs now only three pounds. The same general characteristics as to skin, tissues, bones, &c., that were observed in the preceding bodies, may also be seen here. The head is well developed for a boy of his age. The hair has been broken off near the scalp. Only the cartilaginous parts of the ears remain. There is the same contour of face—flat nose, high cheek-bones, outward obliquity of the eyes, &c. The upper and lower incisores and canine of the temporary or milk teeth are gone, and the permanent set coming at their roots in the alveolar processes.

The two anterior molars of the superior maxillary are just appearing through the alveolar processes, establishing the age with tolerable accuracy at about seven years.

In circumference the skull measures 440 millimetres; length, occipito-frontal, 146 mm.; breadth, bi-bregmatic, 120 mm.; breadth of frontal, 60 mm.; height, 114 mm.; facial angle, 71°.

A considerable part of the burial shroud remains about the body yet. The major portion of it is cotton fabric, firmly secured around the body by a stronger cord, made of braided hair.

The little girl may have been about fourteen to eighteen months of age. She weighs only a pound and a half. She has been enveloped in an animal's skin, the better to protect the tender frame. Both feet are gone, and the tibiae and fibulae protrude through the skin. The four upper and four lower incisores, with the corresponding canine teeth, have made their appearance, showing the child to be about fourteen to eighteen months old. Otherwise the same features are noticeable in this as in the preceding figures.

It would appear that the group of four belong to one family, and that they were buried by friends, and hermetically sealed in this cave for fear of some real or imaginary foe. It may have been at the time of the Spanish invasion, or it may have been during the warlike times anterior to this date, when the Aztec confederation was warring with the Toltec people.

From their physical and mental developments the race seems to have been a superior one.

The facial features observed in these bodies are not those found in that locality now. The cranial configurations and physical appearances would rather favour Aztec lineaments than those of the Indian of to-day. The fine dark brown hair is certainly not Indian, nor do the small hands and feet bear much resemblance to the huge hands and feet we see on the Indians now living.

The fabrics found on the bodies, forming the burial shrouds, are chiefly composed of cotton, hair, hide, grasses, and the bark of willows. The cotton is twisted and coarsely woven, each thread being from a half to one

millimetre in diameter. The hair is treated in like manner occasionally, although usually it is braided with three or four divisions in each cord. Frequently we find strong strands made of strips of hide covered with willow bark.

Although the weaving of this interesting people is that known as the "plain" process—that is, where the weft passes alternately under and over the threads of the warp, producing more or less open mesh cloth—yet considerable skill and ingenuity were observed in the manufacturing of their blankets, mats, and ornamental cloths, which were frequently interwoven with beads and coloured threads, presenting various designs. Grasses and straws were also woven into mats and cloths, which were of great durability. The skins of animals were also used for clothing purposes.

THE PHILIPPINE ISLANDS.

MR. WALLACE, in his great work "The Geographical Distribution of Animals," divides the Oriental or Indian region of Mr. Sclater into four sub-regions, of which Java, Sumatra, Malacca, Borneo, and the Philippine Islands form one, which he calls the Indo-Malayan. In his discussion of the Indo-Malayan sub-region Mr. Wallace recognizes several subdivisions of it, and treats of the Philippine Islands as one of the most important of these. Though acknowledging the existence of divisions of his sub-regions, he failed to give them technical names, as being at that time uncalled for.

The purpose of this paper is to show that the Philippines themselves are separated into several distinct zoological divisions, and it seems therefore necessary for their study to give technical names to the primary and secondary divisions of the already recognized sub-regions. The terms province and sub-province seem least objectionable, and will be made use of, the Philippine Islands thus forming one of the provinces of the Indo-Malayan sub-region, and the divisions of the group itself sub-provinces.

The zoological province of the Philippines is co-extensive with the political division of the same name, with perhaps the exception of the islands of Sulu and Tawi Tawi, which lie between the Philippines and Borneo, but are claimed by the Spanish.

The sub-provinces proposed are—first, the Northern Philippines, consisting of Luzon and Marinduque, and a number of other small islands about Luzon; second, Mindoro; third, the Central Philippines, made up of the islands of Panay, Negros, Guimaras, Zebu, Bohol, and Masbate; fourth, the Eastern Philippines, comprising the islands of Samar and Leyte; fifth, the Southern Philippines, embracing the great island of Mindanao, with Basilau, and perhaps Sulu; and sixth, the Western Philippines, consisting of the islands of Paragua or Palawan, and Balabac.

The geographical positions of these sub-provinces are so far fortunate, that these names show their relations to each other very closely, as may be seen by consulting a map of the archipelago.

Of the sub-provinces, the Western Philippines, made up of Paragua and Balabac, and perhaps the Calamines, is of most importance, its animal life being much more closely allied to that of Borneo than that of any other sub-province of the group. This is especially noticeable in its mammals, of which it possesses, in common with Borneo, the genera *Tragulus*, *Tupaia*, and *Manis*, which are apparently absent from the rest of the archipelago. Of Bornean genera of birds, not found elsewhere in the group, *Iora*, *Criniger*, *Polyplectron*, *Tiga*, and *Batrachostomus*, are examples. This sub-province has evidently received a large part of its fauna from North Borneo, through Balabac, at a comparatively recent date, and